

REMARKS

Further and favorable reconsideration is respectfully requested in view of the foregoing amendments and following remarks.

Claim Amendments

Claims 1 and 6 have been amended to recite the transitional phrase “consisting of” rather than “comprising”, and to incorporate the limitations of 4 and 5. As a result of these amendments, claims 4, 5, 12-16, 21 and 22 have been cancelled, without prejudice. Claims 2, 3, 7, 8 and 11 have been amended to make editorial changes, in order to better comply with amended claim 1. Support for these amendments is found on page 6, lines 19-22 of Applicants’ specification. Therefore, no new matter has been added to the application.

Rejection Under 35 U.S.C. § 112, First Paragraph

The rejection of claims 6-8 and 23-25 under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement is respectfully traversed.

The Examiner takes the position that there is no description in the specification of how to form the non-solid solution, recited in claim 6.

Applicants note that claim 6 describes all of the elements constituting the alloy, so that the alloy can be easily manufactured to result in the recited amounts of the constituent elements. Further, as recited in the claim, the optimal amount of the non-solid solution substance is 1.20 to 4.90 vol%, and the non-solid solution substance is secured with Bi or with Bi and Se.

Applicants’ specification clearly defines the term “non-solid solution” on page 10, lines 13-15. Specifically, “[t]he term ‘non-solid solution’ refers to an element or a compound that shuns forming a solid solution in the matrix of an alloy within the practical range and exists along the crystal grain boundary or in the grain.” Furthermore, Applicants’ specification recites Bi and Pb mostly existing solely and Se existing in the form of a compound (Bi-Se, Se-Zn, etc.) as examples of the non-solid solution. (See page 26, lines 11-12 of Applicants’ specification.)

Additionally, Applicants' specification provides the theoretical value of the non-solid solution in the form of a mathematical formula and clearly describes how to combine Bi and Se to arrive at the desired amount of non-solid solution. Pages 26 and 27 of Applicants' specification also clearly sets forth the method for determining the volume ratios of the amounts of non-solid solutions

Furthermore, since the elements constituting the alloy are clearly recited, the description of the respective ranges of the constituent elements makes it clear to form Bi and Se as the non-solid solution.

For the above reasons, the rejection under 35 U.S.C. § 112, first paragraph should be withdrawn.

Prior Art Rejection

The patentability of the present invention over the disclosures of the references relied upon by the Examiner in rejecting the claims will be apparent upon consideration of the following remarks.

The rejection of claims 1-8, 10-16 and 19-25 under 35 U.S.C. § 103(a) as being unpatentable over Oishi, JP '375 or Singh is respectfully traversed.

The Examiner takes the position that Oishi or JP '375 disclose the features including the claimed Cu based alloy composition, and that Singh disclose examples of Cu based alloys generally including elements Sn and Bi which contents overlap the claimed ranges.

The Examiner admits that the references are silent about the volume of "non-solid solution". However, the Examiner asserts that the "non-solid solution" property is a material property formed during casting which would have been inherently possessed by the materials of the cited references, since the instant claimed alloying elements are overlapped by the materials of the cited references.

Comments Concerning Examiner's Response to Arguments

The following comments are in regard to the Examiner's statement that the "non-solid solution" property is a material property formed during casting. Certainly, the non-solid solution substance is a substance formed in consequence of casting. However, in order for the substance to reduce the porosity, it is required to limit the kinds of substances capable of manifesting the effect based on the ranges of the components constituting the alloy of Applicants' invention and to secure the necessary amount of the substances based on the solidified mode peculiar to the alloy of Applicants' invention. In identifying the alloy of Applicants' invention, with the aim of improving the castability, the kind and amount of the non-solid solution substance are restricted. Mere crystallization of a non-solid solution substance is insufficient. Even if the non-solid solution substance should be restricted, no effect can be obtained insofar as the restriction is made in consideration of the composition of an alloy and a solidified mode of the alloy. Thus, the characteristics of the non-solid solution substance referred to in Applicants' invention differ from those of an ordinary non-solid solution substance.

Discussion of Oishi (US 6,413,330)

As discussed above, Applicants have amended independent claims 1 and 6 to recite the transitional phrase "consisting of" rather than "comprising". MPEP 2111.03 states that the transitional phrase "consisting of" excludes any element, step, or ingredient not specified in the claim, except for unavoidable impurities. The alloy disclosed in Oishi requires silicon, in an amount greater than 3 percent. Thus, the teachings of Oishi require an element which has been excluded from Applicants' claimed alloy.

Therefore, the subject matter of Applicants' claims is clearly patentable over Oishi.

Discussion of Singh (US 5,487,867)

As discussed above, Applicants have amended independent claims 1 and 6 to recite the transitional phrase "consisting of" rather than "comprising". MPEP 2111.03 states that the transitional phrase "consisting of" excludes any element, step, or ingredient

not specified in the claim, except for unavoidable impurities. The alloy disclosed in Singh requires at least copper, bismuth and misch metal, or its rare earth equivalent. Column 6, lines 14-19 of the reference describes misch metal as a rare earth alloy, such as one containing 3% iron and 96% rare earth metals and 1% residuals. Thus, the teachings of Singh clearly require an element (misch metal) which has been excluded from Applicants' claimed alloy.

Therefore, the subject matter of Applicants' claims is clearly patentable over Singh.

Discussion of JP 2000-129375

As discussed above, Applicants have amended independent claims 1 and 6 to recite the transitional phrase "consisting of" rather than "comprising". MPEP 2111.03 states that the transitional phrase "consisting of" excludes any element, step, or ingredient not specified in the claim, except for unavoidable impurities. The alloy disclosed in JP '375 requires at least Cu, Zn, Bi, Sn, Se, Mg and misch metal. Thus, the teachings of JP '375 clearly require elements (Mg and misch metal) which have been excluded from Applicants' claimed alloy.

Thus, the invention of Applicants' claims is clearly patentable over JP '375.

For these reasons, the invention of claims 1-8, 10-16 and 19-25 is clearly patentable over Oishi, JP '375 and Singh.

Conclusion

Therefore, in view of the foregoing amendments and remarks, it is submitted that of the ground of rejection set forth by the Examiner has been overcome, and that the application is in condition for allowance. Such allowance is solicited.

If, after reviewing this Amendment, the Examiner feels there are any issues remaining which must be resolved before the application can be passed to issue, the Examiner is respectfully requested to contact the undersigned by telephone in order to resolve such issues.

Respectfully submitted,

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